

# Things to Know, Understand and Do

## Chapter 17: Electrochemistry

*By the end of Chapter 17, you should*

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| <b>know how to...</b>  |
| 1. In a voltaic electrochemical cell, identify the $\frac{1}{2}$ reactions occurring at the cathode and anode, the polarity of electrodes, the direction of electron flow in the external circuit and the direction of ion flow in the salt bridge             |
| 2. Describe the standard hydrogen electrode (SHE) and explain how it is used as the standard ( $E^\circ=0.00$ V) to determine the standard potentials of half reactions.   |
| 3. Know how to use a table of standard reduction potentials to rank strengths of oxidizing and reducing agents, to predict what substances can oxidize or reduce another species, and to predict whether redox reactions will be reactant- or product- favored |
| 4. Know how to use standard reduction potentials to determine cell voltages for cells under standard conditions  |
| 5. Know how to use a table of standard reduction potentials to rank strengths of oxidizing and reducing agents, to predict what substances can oxidize or reduce another species, and to predict whether redox reactions will be reactant- or product- favored |
| 6. Use the Nernst Equation to calculate the cell potential under non-standard cell conditions.   |
| 7. Explain how cell voltage relates to ion concentration.  |
| 8. Use the relationships between $E_{\text{cell}}$ and the free energy and between $E_{\text{cell}}$ and $K$ for the cell reaction.  |
| 9. Describe the chemical processes occurring in electrolysis. Recognize factors that determine which substances are oxidized and reduced at electrodes.  |
| 10. Relate the amount of a substance oxidized or reduced to the amount of current and the time the current flows.  |
| <b>understand...</b>   |
| 11. Understand the process by which standard reduction potentials are determined and identify standard conditions as apply to electrochemistry   |

### Chapter Homework

p 829 Q 3, 5  
 p 830 Q 7, 16 a + e  
 p 831 Q 27, 35, 37, 43  
 p 832 Q 46, 53, 56, 57  
 p 833 Q 69  
 p 834 Q 75, 78, 82, 87

### Student Presentations

p 831 Q 25  
 p 832 Q 58  
 p 833 Q 71  
 p 834 Q 83